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OF THE

MINING JOURNAL.

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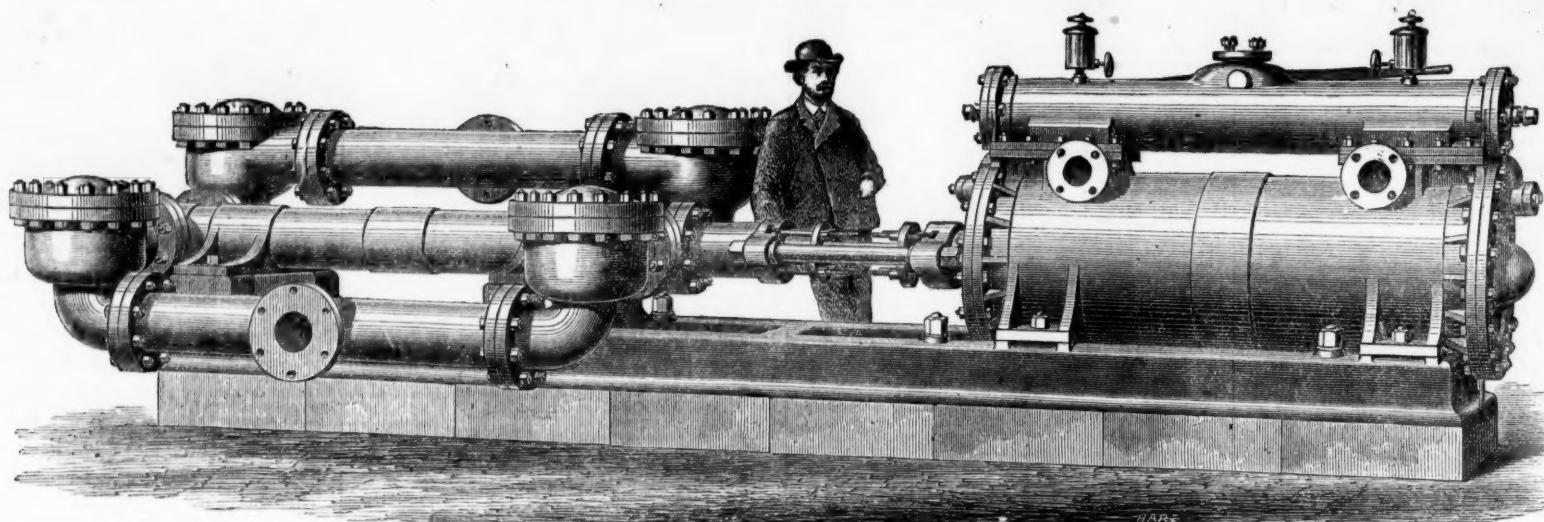
TANGYE BROTHERS AND HOLMAN,

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CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,
NEWCASTLE-ON-TYNE (TANGYE BROTHERS AND RAKE), OFFICES AND WAREHOUSE, ST. NICHOLAS' BUILDINGS.
SOLE MAKERS OF

THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGINES FOR FORCING WATER FROM MINES.

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The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or massive foundations, no repetition of Plunger Lifts, ponderous Connecting-rods, or complication of Pitwork, and allow a clear shaft for hauling purposes.

Extract from "ENGINEERING," September 6th, 1872:—

The accompanying engraving illustrates a large specimen of the "Special" Steam Pump, which was brought before the public about four years since by Messrs. Tangye Brothers and Holman. The Pump is the invention of Mr. S. Cameron, of New York, and since its introduction Messrs. Tangye have turned out nearly 3000 from their works.

These pumps are of various sizes, and at first only small ones were made, but as their usefulness became developed the manufacturers designed pumping engines on the same principle for use in collieries. They were first applied to this purpose in the Newcastle collieries about three years since, and through the efforts of the late Mr. A. Stansfield Rake, under the direction of Messrs. Tangye, about 130 of these pumps had been introduced—principally in the collieries of the Durham and Newcastle districts, up to the end of 1870. They were adapted to perform the required duty—varying in almost every case—of forcing from 1000 to 10,000 gallons per hour from depths ranging from 100 to 500 ft. The success of this system of pump led Mr. J. Bigland, the manager of Messrs. Pease's Bishop Auckland Collieries, to conclude that it was adapted for yet heavier work. The result of his investigations into its working led to the manufacture of the engine we have illustrated, for the Adelaide Collieries, belonging to Messrs. Pease, at Bishop Auckland.

"The construction of the Special Steam Pump is so well known

that we need do no more than refer to the dimensions of the various parts. The steam cylinder is 26 in. diameter, and the pump—which is double acting—is $6\frac{1}{2}$ in. diameter, with a 6-ft. stroke. The slide valve is steam-moved, and its alternate action is effected by means of two steel reversing valves, operated by the piston in the interior of the cylinder at either end. Hence there is no external mechanism except the piston rod, a few inches only of which is seen reciprocating between the stuffing boxes of the steam and pump cylinders. In the contract it was stipulated that the engine should raise 120 gallons per minute 1040 ft. high in a single lift, and this is more than accomplished, with apparently as much ease as if its load was delivered at only 100 ft. high.

"The engine-room at the Adelaide Collieries is situated at a depth of 1040 ft. below the surface, and is an arched chamber, about 100 ft. long by 20 ft. wide, and 10 ft. high at centre. At the far end of this chamber is a double-flued boiler, 27 ft. long and 7 ft. in diameter. Placed between the boiler and the shaft is the pumping engine we have been describing. It was started on June 6, 1871, and Mr. Bigland reported that, having measured its duty, he found the average of seven trials to be 137 gallons per minute, thus giving a higher duty than was stipulated for in the contract.

"A still larger Special Steam Pump than the one already described

has since been made by Messrs. Tangye for Messrs. Stannier's collieries, Silverdale, Staffordshire. The steam cylinder of this engine is 32 in. in diameter, and the water cylinder $10\frac{1}{2}$ in.; the stroke is 6 ft., and the engine has to raise 22,500 gallons per hour 540 ft. high. Two out of eight engines for some extensive coal mines in Germany are also in a forward state; each of these engines is to be capable of raising 150 gallons per minute, or 9000 gallons per hour, 750 ft. high. This system of underground pumping engine undoubtedly carries with it the recommendations of simplicity and great power, with a small number of mechanical parts. Its first cost is also very moderate, as compared with the method of raising water from great depths by a series of 40 or 50 ft. lifts. Its practical value was attested in 1867 by the award of a silver medal by the Royal Falmouth Polytechnic Society, which is composed chiefly of mining engineers. In fact, these engines appear to solve a very important commercial question in mining operations—viz., the most economical and effective means of deep mine drainage. Their success has been established in the coal mines of Durham and Newcastle, and there is no reason why their adoption should not follow, as occasion requires, in the copper and tin mines of Cornwall, some of which are of great depth; and especially for foreign mines, where transport convenience and economy are of paramount consideration."

The "Special" Steam Pumping Engines are in use at the following among many other Collieries:	
Adelaide Colliery, Bishop Auckland.	3 Pumps.
Acomb Colliery, Hexham	1 "
Blackfell Colliery, Gateshead	1 "
Black Boy Colliery, Gateshead	1 "
Castle Eden Colliery	2 "
Carr, W. C., Newcastle	4 "
Etherley Colliery	1 "
Gidlow, T., Wigan	3 "
Haswell, Shotton and Easington Coal Company	3 "
Lochelly Iron and Coal Company	2 "
Lochore and Capelbrae Cannel Coal Company	6 "
Leather, J. T., near Leeds	2 "
Lumley Colliery, Fence Houses	1 "
Monkwearmouth Colliery, Sunderland	1 "

North Bitchburn Colliery, Darlington	2 Pumps.	Stott, James and Company, Burslem	1 Pumps.
Newton Cap Colliery, Darlington	1 "	Straker and Love, Brancepeth Colliery	1 "
Normanby Mines	1 "	Seaton Delaval Coal Colliery, near Newcastle	1 "
Oakenshaw Colliery	1 "	Thornley Colliery, Ferryhill	2 "
Pease's West Colliery	2 "	Thompson, John, Gateshead	2 "
Pease, J. and J. W., near Crook	5 "	Trimdon Grange Colliery	1 "
Pease, J. and J., Brandon Colliery	1 "	Tudhoe Colliery	4 "
Pegswood Colliery, near Morpeth	2 "	Vobster and Mells Colliery	2 "
Pelton Fell Colliery	1 "	Widdrington Colliery, Morpeth	5 "
Railey Fell Colliery, Darlington	1 "	Whitworth and Spennymoor Colliery	5 "
Right Hon. Earl Durham, Fence Houses	1 "	Westerton Colliery, Bishop Auckland	1 "
Skelton Mines	1 "	Wardley Colliery, Gateshead	1 "
South Benwell Colliery	5 "	Westminster Brymbo Coal Company	2 "
St. Helens (Tindale) Colliery	1 "	Weardale Coal and Iron Company	5 "

PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

Diameter of Steam Cylinder	Inches	6	8	10	8	12	16	10	14	18	21	14	18	21	26	16	21	24
Diameter of Water Cylinder	Inches	3	3	3	4	4	4	5	5	5	5	6	6	6	7	7	7	7
Length of Stroke	Inches	24	24	36	24	36	48	24	36	36	48	36	48	72	36	48	48	48
Strokes per minute		30	30	20	30	20	15	30	20	20	15	20	20	15	10	20	15	15
Gallons per hour		2,200	2,200	2,200	3,900	3,900	3,900	6,100	6,100	6,100	6,100	8,800	8,800	8,800	11,900	11,900	11,900	11,900
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump		240	425	665	240	540	960	240	470	775	1,058	330	540	740	1,140	312	540	700
Diameter of Suction and Delivery	Inches	2	2	2	3	3	3	3½	3½	3½	3½	4	4	4	4	5	5	5
Diameter of Steam Inlet	Inches	1½	1½	1½	1½	2½	2½	1½	2½	3	3½	2½	3	3½	4	2½	3½	4
Diameter of Exhaust	Inches	1	1½	1½	1½	2½	3	1½	2½	3½	4	2½	3½	4	5	3	4	5

PARTICULARS, &c.—Continued.

Diameter of Steam Cylinder	Inches	30	18	24	30	32	18	24	30	36	21	30	36	42	20	36	44	50
Diameter of Water Cylinder	Inches	7	8	8	8	9	9	9	9	10	10	10	10	12	12	12	12	12
Diameter of Stroke	Inches	72	36	48	72	72	36	48	72	48	72	72	72	48	72	72	96	96
Strokes per minute		10	20	15	10	10	20	15	15	10	15	10	10	15	10	10	10	10
Gallons per hour		11,900	15,660	15,660	15,660	19,800	19,800	19,800	19,800	24,400	24,400	24,400	24,400	35,240	35,240	35,240	35,240	35,240
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump		1,100	300	540	840	960	240	427	665	960	264	540	780	1,062	282	540	800	1,040
Diameter of Suction and Delivery	Inches	5	6	6	6	6	7	7	7	8	8	8	8	10	10	10	10	10
Diameter of Steam Inlet	Inches	5	3	4	o	5½	3	4	5	6	3½	5	6	7	6	8	8	8
Diameter of Exhaust	Inches	6	3½	5	6	6½	3½	5	6	7	4	6	7	5	7	9	9	10

PRICES OF THE ABOVE ON APPLICATION.

Any combination can be made between the Steam and Water Cylinders, to suit Height of Lift and Pressure of Steam.

TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney Lane, London, E.C.